

Please add the following new claims:

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*44*  
44. (New) A substrate for use in the adsorption and non-adsorption of biomolecules having a surface with at least one electrophilic or nucleophilic functional group attached thereto, said substrate having a coating positioned thereon, the coating comprising a chemically crosslinked material comprising elements selected from the group consisting of (1) M, O, C, H, and N; wherein M is a metal selected from the group consisting of silicon, titanium, tantalum, germanium, boron, zirconium, aluminum, hafnium, and yttrium; (2) M, O, H, and N wherein M is defined above; and (3) O, C, H, a and N and wherein the chemically crosslinked material is terminated with the at least one electrophilic or nucleophilic functional group.

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45. (New) A substrate for use in the adsorption and non-adsorption of biomolecules having a surface with at least one electrophilic or nucleophilic functional group attached thereto, said substrate having a coating positioned thereon, the coating comprising a chemically crosslinked material comprising elements selected from the group consisting of (1) M, O, C, H, and N; wherein M is a metal selected from the group consisting of silicon, titanium, tantalum, germanium, boron, zirconium, aluminum, hafnium, and yttrium; (2) M, O, H, and N wherein M is defined above; (3) O, C, H, a and N; and (4) M or C, and one of O, H, or N; and wherein the chemically crosslinked material is terminated with the at least one electrophilic or nucleophilic functional group.

46. (New) A substrate for use in the adsorption and non-adsorption of biomolecules and having a surface with at least one electrophilic or nucleophilic functional group attached thereto, said substrate having a coating positioned thereon, the coating comprising a chemically crosslinked material comprising elements selected from the group consisting of (1) M, O, C, H, and N; wherein M is a metal selected from the group consisting of silicon, titanium, tantalum, germanium, boron, zirconium, aluminum, hafnium and yttrium; (2) M, O, H, and N wherein M is defined above, (3) C; (4) O, C, H, and N; and (5) M or C, and one of O, H, or N, wherein the chemically crosslinked material is terminated with the at least one electrophilic or nucleophilic functional group and wherein the coating is deposited using a comprising tetra methyl silane ( $\text{Si}(\text{CH}_3)_4$ ) precursor.

47. (New) A substrate for use in the adsorption and non-adsorption of biomolecules and having a surface with at least one electrophilic or nucleophilic functional group attached thereto, said substrate having a coating positioned thereon, the coating comprising a chemically crosslinked material comprising elements selected from the group consisting of (1) M, O, C, H, and N; wherein M is a metal selected from the group consisting of silicon, titanium, tantalum, germanium, boron, zirconium, aluminum, hafnium and yttrium; (2) M, O, H, and N wherein M is defined above, (3) C; (4) O, C, H, and N; and (5) M or C, and one of O, H, or N, wherein the chemically crosslinked material is terminated with the at least one electrophilic or nucleophilic functional group and wherein the at least one electrophilic or nucleophilic functional group is deposited by a plasma treatment.

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cont

48. (New) A substrate for use in the adsorption and non-adsorption of biomolecules and having a surface with at least one electrophilic or nucleophilic functional group attached thereto, said substrate having a coating positioned thereon, the coating comprising a chemically crosslinked material comprising elements selected from the group consisting of (1) M, O, C, H, and N; wherein M is a metal selected from the group consisting of silicon, titanium, tantalum, germanium, boron, zirconium, aluminum, hafnium and yttrium; (2) M, O, H, and N wherein M is defined above, (3) C; (4) O, C, H, and N; and (5) M or C, and one of O, H, or N, wherein the chemically crosslinked material is terminated with the at least one electrophilic functional group for electrostatically attracting positively charged molecules for adsorption and electrostatically repelling negatively charged molecules for non-adsorption.

49. (New) A substrate for use in the adsorption and non-adsorption of biomolecules and having a surface with at least one electrophilic or nucleophilic functional group attached thereto, said substrate having a coating positioned thereon, the coating comprising a chemically crosslinked material comprising elements selected from the group consisting of (1) M, O, C, H, and N; wherein M is a metal selected from the group consisting of silicon, titanium, tantalum, germanium, boron, zirconium, aluminum, hafnium and yttrium; (2) M, O, H, and N wherein M is defined

above, (3) C; (4) O, C, H, and N; and (5) M or C, and one of O, H, or N, wherein the chemically crosslinked material is terminated with the at least one nucleophilic functional group for electrostatically attracting negatively charged molecules for adsorption and electrostatically repelling positively charged molecules for nonadsorption.

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50. (New) A substrate for use in the adsorption and non-adsorption of biomolecules and having a surface with at least one electrophilic or nucleophilic functional group attached thereto, said substrate having a coating positioned thereon, the coating comprising an amorphous chemically crosslinked material comprising elements selected from the group consisting of (1) M, O, C, H, and N; wherein M is a metal selected from the group consisting of silicon, titanium, tantalum, germanium, boron, zirconium, aluminum, hafnium and yttrium; (2) M, O, H, and N wherein M is defined above, (3) C; (4) O, C, H, and N; and (5) M or C, and one of O, H, or N, wherein the chemically crosslinked material is terminated with the at least one nucleophilic functional group.

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51. (New) A substrate according to Claim 1, further comprising a nucleic acid nonspecifically adsorbed to said at least one electrophilic or nucleophilic functional group.

52. (New) A substrate according to Claim 1, further comprising a protein nonspecifically adsorbed to said at least one electrophilic or nucleophilic functional group.

53. (New) A substrate according to Claim 1, wherein the coating is deposited using a precursor selected from the group consisting of silanes, siloxanes, silazanes, hydrocarbons, metal organics, titanates, metal alkoxides, and combinations of the above.